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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/696,602

10/28/2003

Zvi Regev

4529

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01/09/2007

EXAMINER

CORRIELUS, JEAN B

ART UNIT

PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/696,602

Applicant(s)

REGEV, ZVI

Examiner

Jean B. Corrielus

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003 and 03 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/28/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because each figure should be labeled "Fig." followed by figure number. For instance "figure 1" should be labeled as "Fig. 1".
2. The claims recite "numerically controlled oscillator" while the drawing only shows "digitally controlled oscillator".
3. Figures 1-5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because it is too short. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: the title of the invention and the priority information should be move to before the first paragraph of page 2. In addition, the priority information should be rewritten as follow:"This application claims priority of the provisional application S/N 60/421,857, filed October 29, 2002."

In addition, it is noted that figs. 6-9 are described under both headings "background of the invention" and ""description of the invention". For examination purpose, examiner considers figs. 6-9, as background art. Page 6, line 12, after "12." Please delete the extra period. Page 8, what does is mean by "sued" as recited in line 4. Appropriate correction is required.

Claim Objections

6. Claims 1-19 are objected to because of the following informalities: the line prior to claim 1 should be replaced by "What is claimed is:". Claim 1, lines 2-3, please convert to uppercase to lower case letter. The same comment applies to any claim having the same deficiency. The line before the start of claim 18 should be deleted. Claim 3, what does it mean by "two digital inputs are available"? Claim 2, line 1, recites "a modified phase detector as in claim 1" however, it is noted that claim 1 is not directed to "a modified phase detector" rather it is directed to a "digital phase lock loop". The same comment applies to the limitation of "digital loop filter", recited in claim 3 and claim 8, "a

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numerically controlled oscillator" recited in claim 4, claim 9, claim 10, claim 14 and claims 18 and 19; "a phase digitizer" recited in claim 6 and claim 16, "a subtractor" in claim 7; "the phase detector", recited in claim 12; "the digital counter", recited in claim 13, the "digital magnitude comparator", recited in claim 17. As per claim 14, "capable of" by an alternate limitation such as "configure to". Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 2-4, 6-10, 12-14, 16-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, line 2, "the phase difference" and "the inputs" lack of proper antecedent basis.

Claim 3 recite "wherein one input not connected..." it not clear as to "the input" of what the limitation refers to.

Claim 4 recites "the other to change the frequency". However, it is unclear as to what frequency is being changed.

As per claim 6, line 1, "the output" lacks of proper antecedent basis. The same comment applies to "the instantaneous phase" recited in line 2. "its input signal" lacks of proper antecedent basis.

Claim 7, "the difference", "the instantaneous phase", "the accumulator", "the instructing clock pulse", as recited in the claim, lack of proper antecedent basis.

As per claim 8, see claim 3.

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As per claim 9, see claim 4.

As per claim 10, the limitation "further modified" is unclear. In addition, "the instantaneous phase" and "the accumulator" lack of proper antecedent basis.

As per claim 12, line 2, "the polarity" lacks of proper antecedent basis.

As per claims 14 and 18, see claim 4.

As per claim 16, see claim 6.

As per claim 17, "the instantaneous phase", "the reference input signal", "the accumulator", "the polarity", "the difference", as recited in the claim lack of proper antecedent basis.

As per claim 19, see claim 10.

9. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the structural relationship between each component recited in the claims.

Double Patenting

10. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re*

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Ockert, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

11. Claims 14 and 18 are objected to under 37 CFR 1.75 as being a substantial duplicate of claim 4. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Belotserkovsky et al US Patent No. 6,704,374.

As per claim 1, Belotserkovsky et al teaches (fig. 3) a phase detector 74 considered as the claimed "modified phase detector"; loop filter 76 considered as the claimed "digital loop filter" and a NCO 80.

As per claim 2, the NCO produces a digital output inherently proportional to the inputs of the phase detector 74 because as the inputs to the detector change the numerically value output by the NCO changes to reflect the changes in the inputs.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Belotserkovsky et al in view of Tang US Patent No. 6,937,685.

As applied to claim 1 above, Belotserkovsky et al teaches every feature of the claimed invention but does not explicitly teach the additional limitations of a digital integrator having an scalable clock rate and an adder wherein one input not connected to the digital integrator is not scalable. Tang teaches the additional limitations of a digital integrator 970 having an scalable (divided) clock rate see output of 990 and an adder (accumulator) see the digital circuitry upstream to the integrator 970 wherein one input not connected to the digital integrator is not scalable (divided) see output of the clock divider 990. Given that fact, it would have been obvious to one skill in the art to

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incorporate such a teaching in Belotserkovsky et al so as to remove efficiently residual signal from the composite phase error signal so as to enhance system accuracy.

16. Claim 4, 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belotserkovsky et al in view of Paff US Patent No. 5,425,057.

As per claims 4, 14, and 18, applied to claim 1 above, Belotserkovsky et al teaches every feature of the claimed invention but does not explicitly teach the additional limitations of "wherein two digital inputs are available one to control the center frequency of the oscillator and the other to change the frequency in accordance with instructions from the loop filter. Paff teaches fig. 3 two digital inputs are available one to control the center frequency of the oscillator and the other to change the frequency in accordance with instructions from the loop filter see fig. 3 the two inputs to the adder 48. It would have been obvious to one skill in the art to incorporate such a teaching in Belotserkovsky et al so as to improve system sensitivity.

17. Claims 5, 6, 10, 15, 16 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Takashi et al US Patent No. 5,841,303.

As per claim 5, Takashi et al teaches, a phase digitizer 1; a digital subtractor 4; a digital loop filter 7; counter 15" considered as the claimed "modified NCO".

As per claim 6, the output of the digitizer in response to a clock pulse is inherently the instantaneous phase of its input signal at the moment of the instruction clock pulse.

As per claim 10, the output of the counter (NCO) is modified by the frequency divider 17.

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As per claim 15, Takashi teaches a phase digitizer 1; a digital magnitude comparator 33, a counter 31; a digital loop filter 7; and counter 15" considered as the claimed "NCO".

As per claim 16, see claim 6.

As per claim 19, see claim 10.

18. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi et al US Patent No. 5,841,303.

As applied to claim 7 above, Takashi et al discloses every feature of the claimed invention and in addition teaches that the subtractor calculates a difference between the instantaneous phase of the input and the output of the register 13 as oppose to the instantaneous phase of the accumulator included in the NCO. It would have been obvious to one skill in the art to modify Takashi in such a way as to generate a difference signal between the between the instantaneous phase of the of the input and the instantaneous phase of the accumulator included in the NCO as oppose to the output of the register 13 so as to ensure that the input signal in the output of the oscillator operate at the same frequency so as to enhance system sensitivity.

19. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi et al in view of Tang US Patent No. 6,937,685.

As applied to claim 1 above, Takashi et al teaches every feature of the claimed invention but does not explicitly teach the additional limitations of a digital integrator having an scalable clock rate and an adder wherein one input not connected to the

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digital integrator is not scalable. Tang teaches the additional limitations of a digital integrator 970 having an scalable (divided) clock rate see output of 990 and an adder (accumulator) see the digital circuitry upstream to the integrator 970 wherein one input not connected to the digital integrator is not scalable (divided) see output of the clock divider 990. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Takashi et al so as to remove efficiently residual signal from the composite phase error signal so as to enhance system accuracy.

20. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi et al in view of Paff US Patent No. 5,425,057.

As applied to claim 5 above, Takashi et al teaches every feature of the claimed invention but does not explicitly teach the additional limitations of "wherein two digital inputs are available one to control the center frequency of the oscillator and the other to change the frequency in accordance with instructions from the loop filter. Paff teaches fig. 3 two digital inputs are available one to control the center frequency of the oscillator and the other to change the frequency in accordance with instructions from the loop filter see fig. 3 the two inputs to the adder 48. It would have been obvious to one skill in the art to incorporate such a teaching in Takashi et al so as to improve system sensitivity.

21. Claims 11, 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Eubanks US Patent Publication No. 20030063701A1.

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As per claim 11, Eubanks teaches a DPLL see figs. 2 and 3 comprising a phase detector 320; a digital counter 330; and a NCO 230.

As per claim 13 the counter inherently counts either up or down.

22. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eubanks US Patent Publication No. 20030063701A1 in view of Patterson US Patent No. 5,883,536.

As applied to claim 11 above, Eubanks teaches every feature of the claimed invention but does not explicitly teach the further limitations of "the phase detector produces digital commands indicating the polarity of the phase error". Patterson teaches "the phase detector produces digital commands indicating the polarity of the phase error". See fig. 1 it would have been obvious to one skill in the art to incorporate such a teaching in Eubanks in order to monitor the direction of the phase error so as to provide proper phase compensation.

23. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi et al US Patent No. 5,841,303.

Takashi teaches every feature of the claimed invention but does not explicitly teach the further limitation of wherein the comparator compares the magnitude of the instantaneous phase of the reference input signal, reported by the phase digitizer and the instantaneous phase of the accumulator of the numerically controlled oscillator, and wherein the comparator outputs indicate the polarity of the difference between the

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phases. However, it would have been obvious to one skill in the art to modify Takashi in such a way as to compare the magnitude of the instantaneous phase of the reference input signal, reported by the phase digitizer and the instantaneous phase of the accumulator of the numerically controlled oscillator, and wherein the comparator outputs indicate the polarity of the difference between the phases in order to effectively detect the occurrence of phase error and to provide proper phase correction.

Information Disclosure Statement


24. The information disclosure statement filed 10/28/03 has not been considered because the hand written information is hard to read. In addition, the top section of each IDS sheet must be filled out completely. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Jean B Corrielus
Primary Examiner
Art Unit 2611

12-21-06